

NAVAL SHORE FACILITIES CORROSION CONTROL PROGRAM

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IMPACTS OF CORROSION

***CORROSION IMPACTS SHORE FACILITIES IN
MORE WAYS, AND TO A FAR GREATER DEGREE
THAN REGULARLY CONSIDERED:***

- **COSTLY SYSTEM REPAIRS & REPLACEMENTS**
- **DOWNTIME AND DISRUPTION OF SERVICE**
- **EXPENSIVE LOSS OF PRODUCT**
- **ENVIRONMENTAL AND SAFETY HAZARDS**
- **DECREASED SYSTEM CAPACITIES**
- **ADVERSE IMPACTS ON OPERATIONAL
READINESS**

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WHY IS CORROSION A BIG PROBLEM?

- **CORROSION IS A FORCE OF NATURE THAT WILL OCCUR. WHEN LEFT UNCHECKED, IT IS NOT A MATTER OF IF A STRUCTURE WILL CORRODE, BUT WHEN IT WILL FAIL**
- **MANY CRITICAL FACILITIES ARE BURIED OR SUBMERGED - "OUT OF SIGHT, OUT OF MIND". CORROSION PROBLEMS ARE NORMALLY IDENTIFIED AFTER FAILURE WHEN IT BECOMES COSTLY TO FIX**

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TIME TO CORROSION FAILURE

NEW OR NEWLY REPAIRED STEEL STRUCTURES CAN FAIL OR REQUIRE MAJOR REPAIRS WITHIN THE FOLLOWING TIME FRAMES:

- **BURIED STEEL STRUCTURES: 6 YEARS (CORROSION CAUSED HOLES)**
- **SUBMERGED STEEL WATERFRONT STRUCTURES: 9 YEARS (SIGNIFICANT THINNING OF METAL TO ADVERSELY AFFECT STRUCTURAL CAPACITY)**

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CORROSION CONTROL METHODS

- PROPERLY APPLIED PROTECTIVE COATINGS ARE EFFECTIVE FOR STRUCTURES EXPOSED TO THE ATMOSPHERE. FOR BURIED OR SUBMERGED STRUCTURES, CONCENTRATED CORROSION WILL OCCUR AT DEFECTS IN THE COATINGS
- **CATHODIC PROTECTION (CP), A VERY EFFECTIVE CORROSION CONTROL METHOD** ON ITS OWN, COMPLEMENTS COATINGS AND WILL EXTEND COATING AND STRUCTURE LIFE SIGNIFICANTLY

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CP AND CORROSION CONTROL BENEFITS

- A PROPERLY OPERATED AND MAINTAINED CP SYSTEM CAN **EXTEND THE LIFE** OF A STRUCTURE AT LEAST **15 - 20 YEARS**
- REPLACEMENT OF CP COMPONENTS EVERY 15 TO 20 YEARS CAN **EXTEND STRUCTURE LIFE INDEFINITELY**
- THE ANNUAL MAINTENANCE AND PERIODIC REPAIR COSTS ARE FAR LESS THAN MAJOR REPAIRS TO OR REPLACEMENT OF THE STRUCTURES THEMSELVES
- AVOID HIGH ENVIRONMENTAL CLEANUP COSTS

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CP SYSTEM LIMITATIONS

- CAN ONLY PROTECT STRUCTURES THAT ARE BURIED OR SUBMERGED. COATINGS AND MATERIAL SELECTION ARE NECESSARY FOR ATMOSPHERIC CORROSION CONTROL
- CANNOT REPLACE METAL ALREADY LOST
- IMPRESSED CURRENT CP SYSTEMS CAN INADVERTENTLY CAUSE CORROSION ON NEIGHBORING STRUCTURES IF NOT PROPERLY DESIGNED

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CORROSION CONTROL REQUIRED

CORROSION CONTROL IN CONJUNCTION WITH OTHER PROTECTIVE MEASURES IS REQUIRED FOR THE FOLLOWING BURIED OR SUBMERGED METALLIC UTILITY SYSTEMS:

- NATURAL GAS PIPELINES
- OXYGEN PIPELINES
- PETROLEUM, OIL & LUBRICANTS (POL) PIPELINES
- POL AND FUEL STORAGE TANKS
- HAZARDOUS SUBSTANCE STORAGE TANKS
- WATER STORAGE TANK INTERIORS

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CORROSION CONTROL RECOMMENDED

**CORROSION CONTROL IS RECOMMENDED FOR THE
FOLLOWING BURIED OR SUBMERGED METTALIC
UTILITY SYSTEMS:**

- **STEAM DISTRIBUTION SYSTEMS**
- **COMPRESSED AIR DISTRIBUTION SYSTEMS**
- **STEEL SHEET BULKHEADS**
- **STEEL FENDER AND BEARING PILES FOR PIERS**
- **MOORING COMPONENTS**

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LANTDIV's CORROSION CONTROL SERVICES

- **PROVIDE ASSISTANCE TO IMPLEMENT A CORROSION
CONTROL PROGRAM PER LANTNAVFACENGCOM
INSTRUCTION 11014.9 OF 21 MAR 95.**
- **REVIEW CONSTRUCTION AND MAINTENANCE PROJECTS
FOR APPROPRIATE CORROSION CONTROL MEASURES**
- **PREPARE AND REVIEW PROJECTS FOR CORRECTING
CORROSION PROBLEMS**
- **PROVIDE TECHNICAL ASSISTANCE DURING THE
INSTALLATION OR APPLICATION OF COOROSION
CONTROL MEASURES.**

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(corrosion control services cont.)

- IMPLEMENT CORROSION CONTROL MAINTENANCE AND OPERATION PLANS TO KEEP CORROSION CONTROL SYSTEMS EFFECTIVE.
- MONITOR OPERATION OF EXISTING CATHODIC PROTECTION SYSTEMS (MONTHLY & ANNUAL INSPECTIONS)
- PROVIDE TRAINING IN CORROSION CONTROL
- TEST AND ADJUST CATHODIC PROTECTION SYSTEMS
- PROVIDE DETAILED CORROSION SURVEYS

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CORROSION SURVEYS

IAW NAVFAC INSTRUCTION 11014.52, PERIODIC FIELD SURVEYS (EVERY THREE TO FIVE YEARS) ARE NECESSARY TO:

- ASSESS EXISTING CONDITION OF THE STRUCTURES
- ASSESS CATHODIC PROTECTION SYSTEM EFFECTIVENESS
- ADJUST CATHODIC PROTECTION SYSTEMS TO PROVIDE CONTINUED PROTECTION

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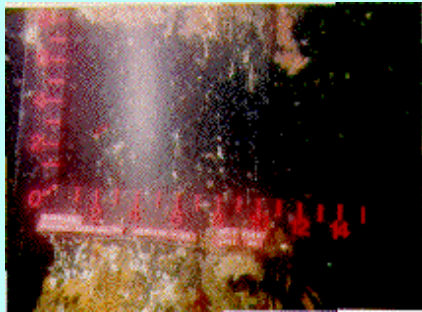
(corrosion surveys cont.)

- **SEARCH FOR UNPROTECTED STRUCTURES WHERE CORROSION CONTROL SYSTEMS WOULD BE BENEFICIAL OR ARE MANDATED**
- **RECOMMEND REPAIRS AND UPGRADES TO EXISTING CORROSION CONTROL SYSTEMS**
- **PROVIDE TECHNICAL ASSISTANCE SUCH AS PREPARING CORROSION CONTROL PROJECT DOCUMENTS AND DESIGNS**

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CORROSION PROGRAM GOALS

THIS!!



SUBMERGED STEEL PILE AFTER 12 YEARS. COATING IN GOOD CONDITION - LITTLE OR NO CORROSION



PIPELINES BEING INSTALLED WITH EPOXY COATING AND CP SYSTEM

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CORROSION PROGRAM GOALS

NOT THIS:



PILE OF CORRODED PIPE



**SHEET PILE WITH NUMEROUS
LARGE CORROSION HOLES**

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CORROSION CONTROL PROGRAM POINT OF CONTACT

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